



Complete Summary

GUIDELINE TITLE

Use of antithrombotic agents during pregnancy. In: Sixth ACCP Consensus Conference on Antithrombotic Therapy.

BIBLIOGRAPHIC SOURCE(S)

Ginsberg JS, Greer I, Hirsh J. Use of antithrombotic agents during pregnancy. Chest 2001 Jan; 119(1 Suppl): 122S-131S. [80 references]

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT
CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

Thrombophilia and pregnancy

GUIDELINE CATEGORY

Management
Prevention
Treatment

CLINICAL SPECIALTY

Emergency Medicine
Family Practice
Internal Medicine
Obstetrics and Gynecology
Pulmonary Medicine

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To present recommendations on the management of thromboembolic complications during pregnancy

TARGET POPULATION

- Pregnant women with or at risk of developing thromboembolic complications
- Symptomatic pregnant women with clinical suspicion of deep vein thrombosis or pulmonary embolism

INTERVENTIONS AND PRACTICES CONSIDERED

Prevention, Management, and Treatment:

1. Screening, as appropriate, for congenital thrombophilia and antiphospholipid antibodies.
2. Antithrombotic pharmacotherapy, including:
 - a. Heparin; mini-dose unfractionated heparin; moderate-dose unfractionated heparin; adjusted-dose unfractionated heparin; prophylactic low-molecular-weight-heparin (for example, dalteparin or enoxaparin); adjusted-dose low-molecular-weight-heparin (weight-adjusted, full-treatment doses of low-molecular-weight-heparin)
 - b. Postpartum anticoagulant therapy (warfarin in combination with initial unfractionated heparin or low-molecular-weight-heparin overlap)
 - c. Aspirin therapy, such as antepartum aspirin; low-dose aspirin therapy in combination with anticoagulant therapy, as appropriate, during pregnancy

Note: Aspirin therapy alone (rather than in combination with anticoagulant therapy) is considered but not recommended during pregnancy.

3. Folic acid supplementation
4. Surveillance of women with symptoms suspicious of deep vein thrombosis or pulmonary embolism, and of women who are at increased risk of venous thromboembolism or thrombophilia
5. Screening with noninvasive tests for deep vein thrombosis, such as compression ultrasound
6. Laboratory testing and monitoring:
 - a. Anti-factor Xa levels
 - b. Partial thromboplastin time
7. Patient education/counseling, such as pre-pregnancy counseling of risks associated with pregnancy in women receiving long-term anticoagulation therapy

MAJOR OUTCOMES CONSIDERED

Efficacy and safety of antithrombotic therapy as evidenced by the following:

- Rates of fetal complications (e.g., spontaneous abortions, congenital fetal anomalies, fetal wastage) with maternal antithrombotic therapy
- Rates of maternal mortality, major bleeding episodes, and thromboembolism

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The participants reviewed information from an exhaustive review of the literature. Different topics (guideline sections) necessitated different literature searches.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

The rating scheme framework captures the trade-off between benefits and risks (1 or 2) (see "Rating Scheme for the Strength of the Recommendations") and the methodologic quality of the underlying evidence (A, B, C+, or C).

Grades of evidence for antithrombotic agents:

1A

Methodological strength of supporting evidence: randomized controlled trials without important limitations

1B

Methodological strength of supporting evidence: randomized controlled trials with important limitations (inconsistent results, methodologic flaws*)

1C+

Methodological strength of supporting evidence: no randomized controlled trials, but randomized controlled trial results can be unequivocally extrapolated; or, overwhelming evidence from observational studies

1C

Methodological strength of supporting evidence: observation studies

2A

Methodological strength of supporting evidence: randomized controlled trials without important limitations

2B

Methodological strength of supporting evidence: randomized controlled trials with important limitations (inconsistent results, methodologic flaws*)

2C

Methodological strength of supporting evidence: observational studies

* Such situations include randomized controlled trials with lack of blinding, and subjective outcomes, in which the risk of bias in measurement of outcomes is high; and randomized controlled trials with large loss to follow-up.

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Consensus Development Conference)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The strength of any recommendation depends on two factors: the trade-off between benefits and risks, and the strength of the methodology that leads to estimates of the treatment effect. The rating scheme used for this guideline captures these factors. The guideline developers grade the trade-off between benefits and risks in two categories: (1) the trade-off is clear enough that most patients, despite differences in values, would make the same choice; and (2) the trade-off is less clear, and each patient's values will likely lead to different choices.

When randomized trials provide precise estimates suggesting large treatment effects, and risks and costs of therapy are small, treatment for average patients with compatible values and preferences can be confidently recommended.

If the balance between benefits and risks is uncertain, methodologically rigorous studies providing grade A evidence and recommendations may still be weak (grade 2). Uncertainty may come from less precise estimates of benefit, harm, or costs, or from small effect sizes.

There is an independent impact of validity/consistency and the balance of positive and negative impacts of treatment on the strength of recommendations. In

situations when there is doubt about the value of the trade-off, any recommendation will be weaker, moving from grade 1 to grade 2.

Grade 1 recommendations can only be made when there are precise estimates of both benefit and harm, and the balance between the two clearly favors recommending or not recommending the intervention for the average patient with compatible values and preferences. Table 2 of the original guideline document summarizes how a number of factors can reduce the strength of a recommendation, moving it from grade 1 to grade 2. Uncertainty about a recommendation to treat may be introduced if the target event that is trying to be prevented is less important (confident recommendations are more likely to be made to prevent death or stroke than asymptomatic deep venous thrombosis); if the magnitude of risk reduction in the overall group is small; if the risk is low in a particular subgroup of patients; if the estimate of the treatment effect, reflected in a wide confidence interval (CI) around the effect, is imprecise; if there is substantial potential harm associated with therapy; or if there is an expectation for a wide divergence in values even among average or typical patients. Higher costs would also lead to weaker recommendations to treat.

The more balanced the trade-off between benefits and risks, the greater the influence of individual patient values in decision making. If they understand the benefits and risks, virtually all patients will take aspirin after myocardial infarction or will comply with prophylaxis to reduce thromboembolism after hip replacement. Thus, one way of thinking about a grade 1 recommendation is that variability in patient values or individual physician values is unlikely to influence treatment choice in average or typical patients.

When the trade-off between benefits and risks is less clear, individual patient values will influence treatment decisions even among patients with average or typical preferences.

Grade 2 recommendations are those in which variation in patient values or individual physician values will often mandate different treatment choices, even among average or typical patients.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

The rating scheme framework captures the trade-off between benefits and risks (1 or 2) and the methodologic quality of the underlying evidence (A, B, C+, or C) (see "Rating Scheme for the Strength of the Evidence").

Grades of recommendation for antithrombotic agents:

1A

Clarity of risk/benefit: risk/benefit clear

Implications: strong recommendation; can apply to most circumstances, without reservation

1B

Clarity of risk/benefit: risk/benefit clear

Implications: strong recommendation; likely to apply to most patients

1C+

Clarity of risk/benefit: risk/benefit clear

Implications: strong recommendation; can apply to most patients in most circumstances

1C

Clarity of risk/benefit: risk/benefit clear

Implications: intermediate-strength recommendation; may change when stronger evidence available

2A

Clarity of risk/benefit: risk/benefit unclear

Implications: intermediate strength recommendation; best action may differ, depending on circumstances or patients' societal values

2B

Clarity of risk/benefit: risk/benefit unclear

Implications: weak recommendation; alternative approaches likely to be better for some patients under some circumstances

2C

Clarity of risk/benefit: risk/benefit unclear

Implications: very weak recommendation; other alternatives may be equally reasonable

COST ANALYSIS

While the American College of Chest Physicians conference participants considered cost in deciding on the strength of recommendations, the paucity of rigorous cost-effective analyses and the wide variability of costs across jurisdictions led the guideline developers to take a conservative approach to cost issues. That is, cost considerations influenced the recommendations and the grades of those recommendations only when the gradient between alternatives was very large.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The initial guidelines were prepared by the chapter committee (the primary authors) and then reviewed separately by the Committee Co-Chairs and methodology experts and finally by the entire group of Consensus Guideline participants.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Please note: This guideline has been updated. The National Guideline Clearinghouse (NGC) is working to update this summary. The recommendations that follow are based on the previous version of the guideline.

Excerpted by the National Guideline Clearinghouse (NGC):

The grading scheme is defined at the end of the Major Recommendations.

When describing the various regimens of unfractionated heparin and low-molecular-weight-heparin, the guideline developers use the following terminology:

- a. mini-dose unfractionated heparin (unfractionated heparin, 5,000 units subcutaneous every 12 hours)
- b. moderate-dose unfractionated heparin (unfractionated heparin subcutaneous every 12 hours in doses adjusted to target an anti-Xa level of 0.1 to 0.3 units per milliliter)
- c. adjusted-dose unfractionated heparin (unfractionated heparin subcutaneous every 12 hours in doses adjusted to target a mid-interval activated partial thromboplastin time into the therapeutic range)
- d. prophylactic low-molecular-weight-heparin (either dalteparin, 5,000 units subcutaneous every 24 hours, or enoxaparin, 40 milligrams subcutaneous every 24 hours, or any once-daily low-molecular-weight-heparin adjusted to target a peak anti-Xa level of 0.2 to 0.6 units per milliliter)
- e. adjusted-dose low-molecular-weight-heparin (weight-adjusted, full-treatment doses of low-molecular-weight-heparin; for example, dalteparin, 200 units per kilogram every 24 hours, or enoxaparin, 1 milligram per kilogram every 12 hours)
- f. postpartum anticoagulants (warfarin for 4 to 6 weeks with a target international normalized ratio of 2.0 to 3.0, with initial unfractionated heparin or low-molecular-weight-heparin overlap until the international normalized ratio is greater than or equal to 2.0)

In addition, the term surveillance refers to clinical vigilance and aggressive investigation of women with symptoms suspicious of deep vein thrombosis or pulmonary embolism.

Management of Pregnant Patients at Increased Risk for Venous Thromboembolism

1. For single episode of prior venous thromboembolism associated with a transient risk factor (and no additional current risk factors, such as morbid obesity or strict bed rest), surveillance and postpartum anticoagulants. This is a grade 1C recommendation.
2. For single episode of idiopathic venous thromboembolism in patients not receiving long-term anticoagulation therapy, surveillance or mini-dose unfractionated heparin or moderate-dose unfractionated heparin or prophylactic low-molecular-weight-heparin, plus postpartum anticoagulants. This is a grade 1C recommendation.
3. For single episode of venous thromboembolism and thrombophilia (confirmed laboratory abnormality) in patients not receiving long-term anticoagulation therapy, surveillance or mini-dose unfractionated heparin or moderate-dose unfractionated heparin or prophylactic low-molecular-weight-heparin, plus

postpartum anticoagulants. The indication for active prophylaxis is stronger in antithrombin-deficient women than the other thrombophilias. This is a grade 1C recommendation.

4. For no prior venous thromboembolism and thrombophilia (confirmed laboratory abnormality), surveillance or mini-dose unfractionated heparin or prophylactic low-molecular-weight-heparin, plus postpartum anticoagulants. The indication for active prophylaxis is stronger in antithrombin-deficient women than the other thrombophilias. This is a grade 1C recommendation.
5. For multiple (more than two) episodes of venous thromboembolism, and/or women receiving long-term anticoagulation therapy (for example, single episode of venous thromboembolism, either idiopathic or associated with thrombophilia), adjusted-dose unfractionated heparin or either prophylactic or adjusted-dose low-molecular-weight-heparin, followed by resumption of long-term anticoagulation therapy postpartum. This is a grade 1C recommendation.

Treatment of Venous Thromboembolism of Pregnancy

The guideline developers recommend either adjusted-dose low-molecular-weight-heparin throughout pregnancy, or intravenous unfractionated heparin (bolus followed by a continuous infusion to maintain the activated partial thromboplastin time in the therapeutic range) for at least 5 days, followed by adjusted-dose unfractionated heparin for the remainder of the pregnancy. To avoid an unwanted anticoagulant effect during delivery in women receiving adjusted-dose low-molecular-weight-heparin or unfractionated heparin therapy, the guideline developers recommend discontinuing the heparin therapy 24 hours prior to elective induction of labor. If the woman is deemed to have a very high risk of recurrent venous thromboembolism (for example, proximal deep vein thrombosis within 2 weeks), therapeutic intravenous unfractionated heparin therapy can be initiated and discontinued 4 to 6 hours prior to the expected time of delivery. Postpartum anticoagulation therapy should be administered for at least 6 weeks. This is a grade 1C recommendation.

Unexpected Pregnancy or Planned Pregnancy in Patients Who Are Receiving Long-term Anticoagulation Therapy

If possible, such women should be counseled about the risks before pregnancy occurs. If pregnancy is still desired, two options can be considered:

1. Perform frequent pregnancy tests and substitute adjusted-dose unfractionated heparin or low-molecular-weight-heparin for warfarin when pregnancy is achieved.
2. Replace warfarin with unfractionated heparin or low-molecular-weight-heparin before conception is attempted. Both approaches have limitations; the first approach assumes that warfarin is safe during the first 4 to 6 weeks of gestation; the second approach increases the duration of exposure to heparin and, therefore, to a higher risk of osteoporosis. The guideline developers favor the first approach because it is convenient and appears to be safe. These are grade 1C recommendations.

Prophylaxis in Patients With Mechanical Heart Valves

One of three approaches is recommended:

1. Aggressive adjusted-dose unfractionated heparin therapy throughout pregnancy (that is, administered subcutaneous every 12 hours in doses adjusted to keep the mid-interval activated partial thromboplastin time at least twice the control, or an anti-Xa heparin level of 0.35 to 0.70 units per milliliter). This is a grade 2C recommendation.
2. Adjusted-dose low-molecular-weight-heparin therapy throughout pregnancy in doses adjusted according to weight or to keep a 4-hour postinjection anti-Xa heparin level at approximately 1.0 unit per milliliter. This is a grade 2C recommendation.
3. Unfractionated heparin or low-molecular-weight-heparin (as above) therapy until the 13th week, a change to warfarin until the middle of the third trimester, and then restart unfractionated heparin or low-molecular-weight-heparin therapy until delivery. This is a grade 2C recommendation.

Long-term anticoagulation therapy should be resumed postpartum with all regimens.

Management of Pregnant Women at Increased Risk for Pregnancy Loss

1. Women with recurrent pregnancy loss (three or more miscarriages) should be screened for antiphospholipid antibodies. If the losses include one or more second-trimester losses, screening for congenital thrombophilia should be performed. Women with prior severe or recurrent preeclampsia, intrauterine growth restriction, abruption, or otherwise unexplained intrauterine death should be screened for congenital thrombophilia and antiphospholipid antibodies.
2. Pregnant patients with antiphospholipid antibodies and a history of multiple (two or more) early pregnancy losses or one or more late pregnancy losses or preeclampsia, intrauterine growth restriction, or abruption should be treated with antepartum aspirin plus mini-dose or moderate-dose unfractionated heparin or prophylactic low-molecular-weight-heparin. This is a grade 1B recommendation.
3. Women found to be homozygous for thermolabile variant (C677T) of methylenetetrahydrofolate reductase should be treated with folic acid supplements prior to conception or, if already pregnant, as soon as possible. This is a grade 2C recommendation.
4. Women with a thrombophilic deficit and (A) recurrent miscarriages, (B) a second-trimester or later loss, or (C) preeclampsia, intrauterine growth restriction, or abruption should be considered for low-dose aspirin therapy plus either mini-dose heparin or prophylactic low-molecular-weight-heparin therapy. We also administer postpartum anticoagulants to these women. These are grade 2C recommendations.
5. Patients with antiphospholipid antibodies and a history of venous thrombosis are usually receiving long-term oral anticoagulation therapy because of the high risk of recurrence. During pregnancy, we recommend adjusted-dose low-molecular-weight-heparin or unfractionated heparin therapy throughout pregnancy and resumption of long-term oral anticoagulation therapy postpartum. This is a grade 2C recommendation.
6. Patients with antiphospholipid antibodies and no prior venous thromboembolism or pregnancy loss should be considered to have an

increased risk for the development of venous thrombosis and, perhaps, pregnancy loss. The guideline developers recommend one of four approaches: surveillance, mini-dose heparin, prophylactic low-molecular-weight-heparin, or low-dose aspirin, 80 to 325 milligrams daily. This is a grade 2C recommendation.

The rating scheme framework captures the trade-off between benefits and risks (1 or 2) and the methodologic quality of the underlying evidence (A, B, C+, or C).

Definitions:

Grades of recommendations:

1A

Clarity of risk/benefit: risk/benefit clear

Methodological strength of supporting evidence: randomized controlled trials without important limitations

Implications: strong recommendation; can apply to most circumstances, without reservation

1B

Clarity of risk/benefit: risk/benefit clear

Methodological strength of supporting evidence: randomized controlled trials with important limitations (inconsistent results, methodologic flaws*)

Implications: strong recommendation; likely to apply to most patients

1C+

Clarity of risk/benefit: risk/benefit clear

Methodological strength of supporting evidence: no randomized controlled trials, but randomized controlled trial results can be unequivocally extrapolated; or, overwhelming evidence from observational studies

Implications: strong recommendation; can apply to most patients in most circumstances

1C

Clarity of risk/benefit: risk/benefit clear

Methodological strength of supporting evidence: observation studies

Implications: intermediate-strength recommendation; may change when stronger evidence available

2A

Clarity of risk/benefit: risk/benefit unclear

Methodological strength of supporting evidence: randomized controlled trials without important limitations

Implications: intermediate strength recommendation; best action may differ, depending on circumstances or patients' societal values

2B

Clarity of risk/benefit: risk/benefit unclear

Methodological strength of supporting evidence: randomized controlled trials with important limitations (inconsistent results, methodologic flaws*)

Implications: weak recommendation; alternative approaches likely to be better for some patients under some circumstances

2C

Clarity of risk/benefit: risk/benefit unclear

Methodological strength of supporting evidence: observational studies

Implications: very weak recommendation; other alternatives may be equally reasonable

* Such situations include randomized controlled trials with lack of blinding, and subjective outcomes, in which the risk of bias in measurement of outcomes is high; and randomized controlled trials with large loss to follow-up.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified for each recommendation (refer to "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

The appropriate use of antithrombotic agents during pregnancy can help prevent and treat venous thromboembolism or systemic embolism, while decreasing the risk and rate of negative maternal and fetal health outcomes.

Subgroups Most Likely to Benefit:

Pregnant women with acute or previous deep vein thrombosis (DVT) or pulmonary embolism (PE), pregnancy loss, thrombophilia, or mechanical heart valves.

POTENTIAL HARMS

General

- Prophylaxis or treatment of deep vein thrombosis and pulmonary embolism involves long-term parenteral unfractionated heparin or low-molecular-weight

heparin, both of which are inconvenient, painful, expensive, and associated with a risk of bleeding, osteoporosis, and heparin-induced thrombocytopenia. These complications are probably less frequent with low-molecular-weight heparin than unfractionated heparin.

Fetal Complications of Anticoagulants During Pregnancy

- Teratogenicity and bleeding are two potential fetal complications of maternal anticoagulant therapy. Neither unfractionated heparin nor low-molecular-weight heparin cross the placenta and therefore do not have the potential to cause fetal bleeding or teratogenicity, although bleeding at the uteroplacental junction is possible.

Maternal Complications of Anticoagulant Therapy During Pregnancy

- In a cohort study, the rate of major bleeding in pregnant patients treated with unfractionated heparin therapy was 2%, which is consistent with the reported rates of bleeding associated with heparin therapy in nonpregnant patients and with warfarin therapy when used for the treatment of deep vein thrombosis. In addition, adjusted-dose subcutaneous unfractionated heparin can cause a persistent anticoagulant effect at the time of delivery, which can complicate its use prior to labor. In a small study, an anticoagulant effect persisted for up to 28 hours after the last injection of adjusted-dose subcutaneous heparin, frequently resulting in deliveries that were complicated by a prolonged activated partial thromboplastin time.
- Bleeding complications appear to be very uncommon with low molecular weight heparin.

Heparin-Induced Osteoporosis

- Long-term heparin therapy has been reported to cause osteoporosis in both laboratory animals and humans.

Safety of Aspirin During Pregnancy

- Potential complications of aspirin during pregnancy include birth defects and bleeding in the neonate and in the mother. The results of a meta-analysis and a large (> 9,000 patients) randomized trial reported that low-dose (60 to 150 mg/d) aspirin therapy administered during the second and third trimesters of pregnancy in women at risk for pregnancy-induced hypertension or intrauterine growth retardation was safe for the mother and fetus because no increase in maternal or neonatal adverse effects occurred in individuals treated with aspirin.

Subgroups Most Likely to be Harmed:

Pregnant women with prosthetic heart valves

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

Interpreting the Recommendations

The authors of these guidelines are offering recommendations that should not be construed as dictates by the readers, including clinicians, third-party payers, institutional review committees, and courts. In general, anything other than a 1A recommendation indicates that the chapter authors acknowledge that other interpretations of the evidence and other clinical policies may be reasonable and appropriate. Even grade 1A recommendations will not apply to all circumstances and all patients. For instance, the guideline developers have been conservative in their considerations of cost, and have seldom downgraded recommendations from 1 to 2 on the basis of expense. As a result, in jurisdictions in which resource constraints are severe, alternative allocations may serve the health of the public far more than some of the interventions that we designate grade 1A. This will likely be true for all less-industrialized countries. However, a weak recommendation (2C) that reduces resource consumption may be more strongly indicated in less-industrialized countries.

Similarly, following grade 1A recommendations will at times not serve the best interests of patients with atypical values or preferences. For instance, consider patients who find anticoagulant therapy extremely aversive, either because it interferes with their lifestyle (prevents participation in contact sports, for instance) or because of the need for monitoring. For such patients, clinicians may reasonably conclude that following some grade 1A recommendations for anticoagulation will be a mistake. The same may be true for patients with particular comorbidities (such as a recent GI bleed or a balance disorder with repeated falls) or other special circumstances (such as very advanced age).

The guideline developers trust that these observations convey their acknowledgment that no guidelines or recommendations can take into account the often compelling idiosyncrasies of individual clinical circumstances. No clinician and no one charged with evaluating the actions of a clinician should attempt to apply their recommendations in a rote or blanket fashion.

Pregnant patients with mechanical heart valves:

There are insufficient grounds to make definitive recommendations about optimal antithrombotic therapy in pregnant patients with mechanical heart valves because properly designed studies have not been performed.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Ginsberg JS, Greer I, Hirsh J. Use of antithrombotic agents during pregnancy. Chest 2001 Jan; 119(1 Suppl): 122S-131S. [80 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 Jan

GUIDELINE DEVELOPER(S)

American College of Chest Physicians - Medical Specialty Society

SOURCE(S) OF FUNDING

Funding was supplied by DuPont Pharmaceuticals.

GUIDELINE COMMITTEE

American College of Chest Physicians Consensus Panel on Antithrombotic Therapy

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Primary Authors: Jeffrey S. Ginsberg, MD, FCCP, Chair; Ian Greer, MD; and Jack Hirsh, MD, FCCP.

Committee Co-Chairs: James E. Dalen, MD, MPH, FCCP; Jack Hirsh, MD, FCCP.

Participants: Giancarlo Agnelli, MD; Gregory W. Albers, MD; Joseph S. Alpert, MD, FCCP; Pierre Amarenco, MD; Sonia S. Anand, MD; David Anderson, MD; Frederick A. Anderson, PhD; Maureen Andrew, MD; Jack E. Ansell, MD; Peter B. Berger, MD; Edward Bovill, MD; Heiner Bucher, MD, MPH; Henry I. Bussey, PharmD; Christopher P. Cannon, MD; John Cairns, MD; G. Patrick Clagett, MD; Clifford W. Colwell, Jr., MD; Barry S. Coller, MD; Deborah J. Cook, MD, MSc, FCCP; Mark

Crowther, MD; Denise Hartnett Daudelin, RN, MPH; Daniel Deykin, MD; J. Donald Easton, MD; Mark H. Eckman, MD; Michael Ezekowitz, MD; Garrett FitzGerald, MD; Valentin Fuster, MD; William Geerts, MD, FCCP; Michael Gent, DSc; Jeffrey S. Ginsberg, MD, FCCP; Steve Goldman, MD; Christopher Granger, MD; Ian A. Greer, MD; Gordon H. Guyatt, MD; Jonathan L. Halperin, MD; Robert A. Harrington, MD; John Heit, MD; Russell D. Hull, MBBS, FCCP; Thomas M. Hyers, MD, FCCP; Mark R. Jackson, MD; Alan K. Jacobson, MD; Roman Jaeschke, MD, MSc, Clive Kearon, MB, PhD, FCCP; J. Ward Kennedy, MD; Seth Landefeld, MD; Mark N. Levine, MD; Herbert J. Levine, MD; H Daniel Lewis, Jr., MD; A. Michael Lincoff, MD; David Matchar, MD; Kevin M. McIntyre, MD, JD; Thomas W. Meade, DM, Alan D. Michelson, MD; Paul Monagle, MBBS; Timothy A. Morris, MD; E. Magnus Ohman, MD, FCCP; Guy Paiement, MD; Carlo Patrono, MD; Stephen G. Pauker, MD; Palle Petersen, MD, DMSc; Graham Frederick Pineo, MD Leon Poller, DSc, MD; Jeffrey J. Popma, MD; Robert Raschke, MD, MS; Gary Raskob, PhD; Joshua Riff; Gerald Roth, MD; Ralph L. Sacco, MD; Eduardo Salazar, MD; Deeb N. Salem, MD, FCCP; Michel M. Samama, MD; Holger J. Schunemann, MD, MSc; Stephen G. Shaughnessy, PhD; Daniel Singer, MD; Paul D. Stein, MD, FCCP; Victor F. Tapson, MD, FCCP; Philip Teal, MD; Pierre Theroux, MD; Alexander G. G. Turpie, MD; Ted Warkentin, MD; John G. Weg, MD, FCCP; Jeffrey Weitz, MD; and H. Brownell Wheeler, MD.

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

Please note: This guideline has been updated. The National Guideline Clearinghouse (NGC) is working to update this summary.

GUIDELINE AVAILABILITY

Electronic copies of the updated guideline: Available from the [Chest - The Cardiopulmonary and Critical Care Journal Web site](#).

Print copies: Available from the American College of Chest Physicians, Products and Registration Division, 3300 Dundee Road, Northbrook IL 60062-2348.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Sixth ACCP Consensus Conference on Antithrombotic Therapy (2001): summary recommendations. Northbrook, IL: ACCP, 2001. (Quick reference guide for clinicians).

Electronic copies: Available from the [American College of Chest Physicians Web site](#). (HTML, Portable Document Format [PDF], and downloadable files intended for use with Palm OS compatible devices are available.)

Print copies: Available from the American College of Chest Physicians, Products and Registration Division, 3300 Dundee Road, Northbrook IL 60062-2348, or by calling 1 (800) 343-2227.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on July 12, 2001. The information was verified by the guideline developer on October 2001.

COPYRIGHT STATEMENT

This NGC summary is based on the original guideline, which may be subject to the guideline developer's copyright restrictions.

© 1998-2004 National Guideline Clearinghouse

Date Modified: 11/15/2004

